

<p>ORAU Team Dose Reconstruction Project for NIOSH</p> <p>Development of the Nevada Test Site (NTS) Site Profile</p>	<p>Document Number: ORAUT-PRES-0021 Effective Date: 08/30/2004 Revision No.: 00 Controlled Copy No.: _____ Page 1 of 27</p>
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RECORD OF ISSUE/REVISIONS

ISSUE AUTHORIZATION DATE	EFFECTIVE DATE	REV. NO.	DESCRIPTION
08/30/2004	08/30/2004	00	Slides used for presentation of the NTS Site Profile to the Southern Nevada Building Trades Union on August 9, 2004. Initiated by William E. Murray.

Development of the Nevada Test Site Site Profile

Bill Murray
Oak Ridge Associated
Universities Team

August 9, 2004

Energy Employees

Occupational Illness

Compensation Program Act

(EEOICPA)

EEOICPA – 2 types of claims

- Department of Labor
 - \$150,000 + medical expenses
 - Radiation-induced cancer
 - Beryllium diseases
 - Silicosis
 - Radiation claims go to NIOSH for dose reconstruction
 - (This is what we are here to talk about.)***
- Department of Energy
 - Workers' Compensation
 - Exposures to toxic substances

NIOSH – National Institute for Occupational Safety and Health

Office of Compensation
Analysis and Support

Contractor:

Oak Ridge Associated
Universities Team

Significant Dates

- December 2000: EEOICPA signed into law.
- July 2001: Department of Labor (DoL) began accepting claims.
- September 2002: ORAU Team awarded contract to support radiation dose reconstruction.

Purpose of This Meeting

- Discuss the Nevada Test Site (NTS) Site Profile.
- Describe what the Site Profile is used for.
- Ask for your suggestions and information.
- Document your concerns and issues.
- Answer your questions.

The Site Profile Supports Dose Reconstruction

The Site Profile:

- Is used by health physicists to reconstruct radiation doses.
- Provides site-specific technical information.
- Minimizes the interpretation of data.
- Can change as new information comes to light.

Contents of the NTS Site Profile

The Site Profile has six sections called Technical Basis Documents (TBDs):

- Introduction
- Site Description
- Occupational Medical Dose
- Occupational Environmental Dose
- Occupational Internal Dosimetry
- Occupational External Dose

NTS Site Profile

Completed sections or TBDs are available at
[http://www.cdc.gov/niosh/ocas/quick.](http://www.cdc.gov/niosh/ocas/quick)

The NTS Site Profile Team

- Was established in May 2003.
- Team Leader is Gene Rollins.
- The TBDs were written by different authors.
- Some TBDs have been approved by NIOSH.

NTS Site Description

- Describes the facilities and activities at NTS since opening in 1951.
- Lists the radioactive materials and radiation sources present.
- Identifies potential internal exposures.
- Identifies potential external exposures.

NTS Site Description (Cont.)

- Nuclear weapons testing.
- Post-test drilling, reentry, and mineback operations.
- Safety testing.
- Nuclear rocket engine testing.
- Radioactive waste management.
- Laboratory operations.
- Well logging operations.
- Experimental facility operations.

NTS Site Description (Cont.)

- Significant radionuclides present: tritium, cobalt, cesium, iodine, radon, uranium, plutonium, and americium.
- Accidental releases

Occupational Medical Dose (X-rays)

- Frequency of chest X-rays.
- X-ray equipment and techniques used.
- Radiation doses to specific organs.
- Use of this information to reconstruct radiation doses.

Occupational X-ray Dose

(Cont.)

- Only P/A and lateral chest X-rays required by the employer are included.
- The X-ray equipment changed over time.
- Older equipment gave off more X-ray radiation resulting in higher doses.
- The X-ray machine doses are not included in worker DOE dose records.

Occupational Environmental Dose (for workers who were not monitored)

Persons who were not radiation workers (not badged) could be exposed to radiation from:

- Radioactive materials in the air.
- Radiation sources in buildings.
- Radioactive materials in the work environment.

Occupational Environmental Dose (Cont.)

This includes the radiation dose inside the body from radioactive materials released into the air on the site that the worker breathes. The radioactive materials released were:

- Tritium, cobalt, strontium, cesium, europium, plutonium, and americium.
- Radon – naturally occurring

Occupational Environmental Dose (Cont.)

Includes the external radiation dose from radioactive materials in the worker's environment:

- Radiation sources in buildings.
- Radioactive materials in storage areas and waste pits.
- Radioactive materials on the ground and on other surfaces.
- Noble gases from seepage.

This dose is measured at several locations on the site.

Occupational Environmental Dose (Cont.)

- Internal radiation dose
 - Calculate the amount of radioactive material taken into the body from the concentration in air.
 - Calculate the dose to specific organs.
- External radiation dose
 - Calculate the dose to the whole body from radiation sources outside of the body.
 - Calculate the dose to specific organs.

Internal Dosimetry

- Methods and practices
- Sources of exposure
- Minimum detectable activity (MDA) for:
 - Whole body, chest, thyroid and
wound counting
 - Urine and fecal analysis
- Reporting levels

Internal Dosimetry (Cont.)

- Bioassay program was started in 1953.
- Workplace air monitoring records are available.
- Urine was tested for tritium, iodine, plutonium, uranium, and fission products.
- Feces were analyzed for plutonium, uranium, and fission products.
- X-ray and gamma-emitting materials were measured in the body using body counters beginning in 1967. Portable equipment was used before then.

External Dosimetry

- Methods and practices
- Sources of exposure
- Adjustments to recorded dose
- Minimum detectable levels (MDLs)
- Instructions for reconstructing dose

External Dosimetry

- Dosimeter technology
 - Gamma – 1951 to 1965
 - Beta, gamma and neutron – 1966 to present
- Calibration procedures
- Exchange frequency
- Workplace radiation fields
- Exposure geometry

In Conclusion

- Developing a usable Site Profile is an important task.
- Site Profiles can change based on your input.

Send Comments on Site Profile Directly to NIOSH

National Institute for Occupational
Safety and Health (NIOSH)

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NIOSH
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